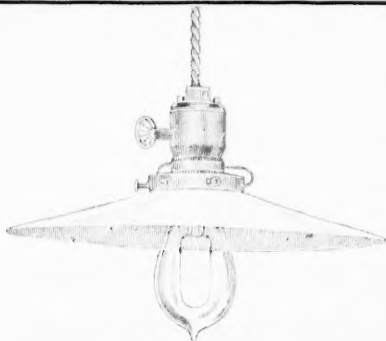
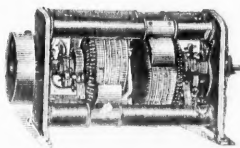




BALL
Electric & Light
- **SYSTEM** -

-- FOR --

All purposes of Illumination



- THE -
Ball Electric Light Co.
OF CANADA (LIMITED)

57 Adelaide Street West

✻ Toronto ✻



We manufacture under the
following

: CANADIAN PATENTS :

**Infringers or users of infringing apparatus
will be prosecuted**

C. E. BALL,	No. 13164, JULY 25, 1881
	EXTENDED, JULY , 1886
"	No. 18020, NOV. 3, 1883
"	No. 17127, JULY 2, 1883
	EXTENDED, JUNE , 1888
R. E. BALL,	No. 26146, MAR. 7, 1887
"	No. 26147, MAR. 7, 1887
"	No. 26156, MAR. 7, 1887
"	No. 26148, MAR. 7, 1887
W. A. JOHNSON,	No. 27258, JULY 25, 1887
"	No. 28035, NOV. 26, 1887
"	No. 28975, APR. 19, 1888
"	No. 29003, APR. 25, 1888
AND PATENTS PENDING	

THE BALL : : :
: ELECTRIC LIGHT CO. :

(LIMITED)

: : 57 Adelaide Street West : :
Toronto, Ont.

THE BALL ELECTRIC LIGHT COMPANY

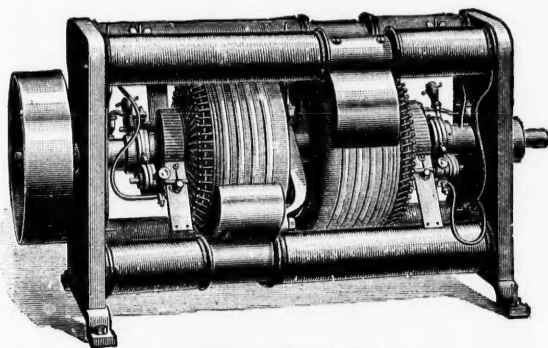
(LIMITED)

OF CANADA

PHELPS JOHNSON
PRESIDENT

E. O. JONES
VICE-PRES.

W. A. JOHNSON
SECRETARY AND GEN. MANAGER



MANUFACTURERS OF THE

BALL ELECTRIC LIGHT SYSTEM

-- FOR --

ALL PURPOSES OF ILLUMINATION

-- FOR --

STREET, MERCANTILE AND MANUFACTURING, DOMESTIC,
MINE, MARINE AND COAST LIGHTING BY ARC OR
INCANDESCENT SYSTEMS, OR BOTH COMBINED

-- ALSO --

ELECTRIC MOTORS AND ELECTRIC LIGHT SUPPLIES

We offer to the public **THE BEST SYSTEM OF ELECTRIC LIGHTING** in the world—The most economical in operation, The most easily cared for, The most durable, The Cheapest in cost—and invite inquiries and correspondence from parties interested.

57 ADELAIDE STREET WEST
TORONTO, ONT.

BINGHAM & WEBBER, TORONTO

POINTERS

FOR INTENDING PURCHASERS OF

ELECTRIC LIGHTING MACHINERY

DON'T forget that your greatest protection is in dealing with a company possessing a GOOD NAME and an ESTABLISHED REPUTATION.

DON'T be deceived by elegant engravings, deceptive testimonials and ready tongued agents, all of which are often found with systems of electric lighting not possessing intrinsic merit and genuine worth.

DON'T allow the successful working of systems WHEN NEW and under skillful attendance to satisfy you; ascertain whether they have been satisfactory in MIDDLE LIFE AND OLD AGE. Remember, "a new broom sweeps clean."

DON'T forget that the "test of time" has proved the armatures of most systems to be short lived, and that when they burn out the manufacturers generally explain that it must have been caused by lightning or over-speeding. They forget these causes never harm the BALL armatures.

DON'T be deceived regarding AUTOMATIC REGULATORS; they are delicate and complicated devices absolutely essential to all one armature dynamos, to delay their destruction from over-heating and burning. The BALL dynamo requires no AUTOMATIC PROTECTION OR REGULATION.

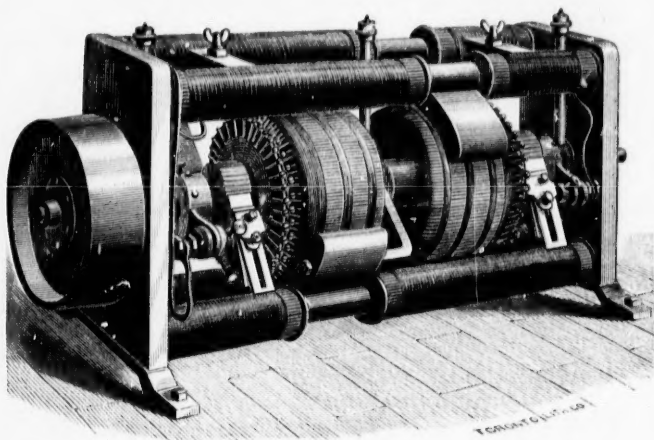
DON'T forget that any NEW AND IMPROVED DYNAMOS must have been in use, under full load and with ordinary care and attention, for at least 5,000 hours before either its designers, makers or vendors can speak with any KNOWLEDGE concerning its durability or freedom from injurious electrical heating. All claims for durability and freedom from repairs and burning, before such a test has been run, are based on FAITH, not KNOWLEDGE, and prompted by self-interest.

DON'T forget that our opponents DARE NOT meet us in thorough scientific tests; and that they have declined to accept our challenges on EVERY OCCASION, FEARING the thorough and decisive tests proposed by us.

DON'T forget that rival manufacturers never publish or offer any challenges open to our acceptance, for thorough competitive scientific tests; they all make great claims, but DARE NOT place their systems along-side the BALL in tests involving EFFICIENCY, ECONOMY, DURABILITY AND SIMPLICITY.

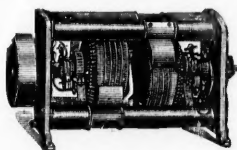
DON'T forget that we manufacture and sell in Canada more ARC ELECTRIC LIGHTING MACHINERY than all other companies combined, and that when we are asked to enter competitive tests, we do not decline with trivial excuses such as being "too busy," etc., etc., etc.

THE BALL ELECTRIC LIGHT COMPANY
(LIMITED)
57 ADELAIDE ST. WEST
TORONTO, ONT.



THE ELECTRIC LIGHT

IS not in its infancy, as is often claimed by people who have no practical knowledge of the subject; it is now well developed and understood, and is evidently the artificial light which will be chiefly used for municipal and business purposes in the future. The great advantage of the electric light is in the volume of light afforded, and that buildings are illuminated by its use to an extent impracticable through the use of gas or oil. The *cost* of electric lighting is usually no greater than gas—in many cases is far less; and when the volume, purity, safety and healthfulness of the light is taken into account, is in all cases the most desirable.



THE SUBJECT OF ELECTRIC LIGHTING

Is worthy of investigation by all users of artificial light, and especially by

MUNICIPAL OFFICERS who may be intrusted with the duty of providing light for streets, public grounds and buildings. For such use it is rapidly being adopted by the cities and villages of Canada and of the States, and we know of no instance where, once fairly tried, its use has not been adhered to. The electric light is the only known mode of satisfactorily illuminating at moderate cost, streets, squares, and all large outdoor and indoor spaces.

MANUFACTURERS AND MILL OWNERS find their output, while using the electric light, to be nearly as great as during the hours of daylight. In many instances the amount of work done has been increased 20 to 50 per cent. over that done by gas light, and the saving in cost of manufacture has repaid the full cost of the plant in a short time. For manufacturers having surplus power, the electric light is cheaper than gas or oil, and is in all cases safer and more desirable.

MERCHANTS find their evening trade greatly increased by the use of the electric light; colors can be distinguished by it as well as by daylight, and a brilliantly lighted store always draws custom. The cost is usually no greater than for lighting a store well by gas; the air is not vitiated, and goods are not injured by smoke and soot.

PARKS, HOTELS, SUMMER RESORTS, and all places of public resort and recreation, should be provided with the electric light, for, aside from being the only available means of general and satisfactory illumination, experience has shown that the lights, through making the resorts attractive, draw enough additional to fully repay the expense.

OWNERS OF WATER AND STEAM POWER, situated in or near a city or village, can in many instances render their power the source of considerable income during the hours of darkness by renting or selling power, in the form of light, to merchants, manufacturers or municipalities.

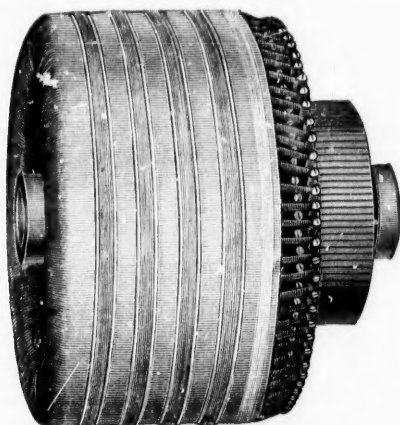
JOINT STOCK COMPANIES are being formed in many cities and villages for the purpose of putting in and operating electric light plants, supplying light to merchants, manufacturers, hotels, etc., and for municipal purposes. A legitimate and profitable investment of capital is found in these enterprises.

THE BALL SYSTEM

OF ELECTRIC LIGHTING

ITS MERITS AND SUPERIORITY

The important factor in all systems of electric lighting is the DYNAMO, or *Current Generating Machine*. These machines are all based upon the same general principle; all generate currents in the same manner, and, with the single exception of the BALL DYNAMO, all machines bear a striking resemblance to each other in the essential elements of their construction, the current being generated in *one* armature or bobbin of wires, which is rotated within the inductive influence of both the positive and negative of a powerful electro-magnet.



BALL ARMATURE (Patented

The BALL DYNAMO has *two* armatures or bobbins, one of them being rotated within the influence of the positive pole, and the other within the influence of the negative pole of an electro-magnet.

This construction has been proved to possess great merit, and the BALL DYNAMO is constructed with *less material*, has *less internal resistance*, has *greater efficiency*, generate *less heat*, and to give *equal* results requires *less power* than any other dynamo in the world.

The greatest difficulty with which electricians have to contend in the construction and operation of electric current generators, is the electrical heat developed by the current within the coils and armatures of the machines, which chars the material with which the wires are covered, and destroys the insulation. The BALL DYNAMO *does not heat*.

M

RITY

ighting
These
nciple ;
ith the
es bear
essential
gener-
rotated
ve and

obbins,
of the
of the

s great
ith less
iciency,
res less

s have
electric
l by the
achines,
covered,
not heat.

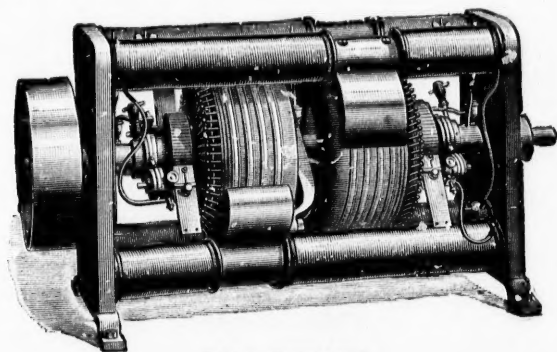
By placing a given amount of insulated copper wire over two armatures, as in the BALL DYNAMO, instead of over one armature, two very important results are obtained:

FIRST.—The thickness of the wire is greatly reduced, owing to the smaller number of layers of wire employed around the iron core; and it is quite evident that any heat generated in the armature is but one-half, and, having the same radiating surface, the temperature must be much less.

Results: It does not generate undue or excessive heat in its armature, and therefore we offer with it no cooling devices, ventilating apparatus or regulating attachment. Heat is *prevented* by the construction of the machine with two armatures, and no *cure* is required.

SECOND.—The iron core of each armature is brought much nearer the pole pieces than is possible with single armature machines, and the average distance of the insulated copper wire is also nearer to the pole piece, and consequently the electrical output is greater.

So free from heat is the BALL DYNAMO, that the speed of the machine can be increased to furnish current for 50 per cent. more lamps than its nominal capacity, without danger of charring the insulation of the wires, while the speed of single armature Dynamos cannot be materially increased without great danger of immediate destruction. The single armature Dynamos in the market are rated at the full capacity to which they can be run, while the BALL DYNAMOS, as rated, have a very large margin for safety against injurious heat.

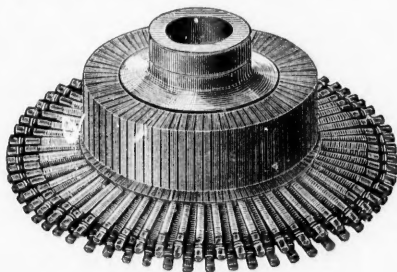


BALL DYNAMO

No other Dynamo is so simple in construction or easily understood. The very minimum of attention is required, even under the most adverse circumstances.

 REGULATORS, DIALS or CURRENT GOVERNORS are NOT REQUIRED ; they are a useless expense and consumers of power, but will be furnished if called for.

An Ammeter or current indicator furnished with each dynamo without extra charge.



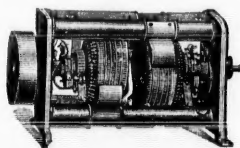
BALL COMMUTATOR
CONSTRUCTION PATENTED

THE BALL ARC LAMPS

Are of neat appearance and substantial construction. There are no springs, frictions, clutches or glycerine dash-pots in them to lose adjustment, but every movement is positive and mechanical. They do not wear or get out of order, and will run for years without repairs and with but slight attention. Their operation is unaffected by vibrations caused by storms, or jarring from machinery or other causes, and will be found reliable under any rough treatment to which they may be exposed. They do not "burn out," neither do they require constant cleaning and watching, as do those of other systems. The light given is white, powerful, *steady* and *noiseless*.

THE CURRENT

We have adopted for our standard light a certain current and electro-motive force, which from experience we recommend as most satisfactory and economical ; but we are prepared to furnish Dynamos and lamps for any current and electro-motive power which may be desired.



THE BALL DYNAMO

HAS THE FOLLOWING ADVANTAGES OVER ALL OTHERS

It produces a more constant and uniform current, and far more *clear, steady and noiseless lights*. It requires no cooling, regulating or safety devices whatever.

It will *outlast* any other Dynamo, as the normal heat generated within it is much less, and more readily radiated.

It does not require to be run at an exact speed, and any power of ordinary uniformity will produce good results.

It is the only Dynamo that will not overheat when subjected to the variable speed of engines used in mills, factories, etc. Over-speeding does not effect it.

It does not require the attendance of an expert, but any intelligent man can quickly be taught to operate it with success.

It has made the longest continuous runs of any Dynamo yet constructed without heating.

It has been in practical operation for six years, and has been subjected to more severe tests than any other machine in the market.

It has extraordinary efficiency, and leaves but little, if any, room for improvement in electrical generation by induction.

Its mechanical construction is of the best. The shaft is hammered steel, ground to standard size, the bearings gun metal, the frame forged iron, surface ground and finished bright. The workmanship will bear the closest inspection. The wear of commutators and consumption of brush copper is very slight.

It requires but two-thirds of one horse-power to produce each full arc light of 2,000 nominal candle-power.

It requires but two-thirds of the power required by all other Dynamos made in Canada or United States to produce an equal amount of light.

It is equivalent to two Dynamos of any other make, for the reason that if one armature is disabled by accident, the other armature will maintain nearly three-fourths of the full number of lights.

It will give more perfect results with less skilled attendance than any other Dynamo.

It can operate arc or incandescent lights separately, or both in combination, in one circuit, or in two separate circuits, at the same time.

THE BALL SUB-DIVIDED ARC LIGHT

We invite the special attention of Gas Companies to the following, believing that, if at all considering the consolidation of gas and electric light interests, the Ball System possesses advantages which cannot be offered by any other Company.

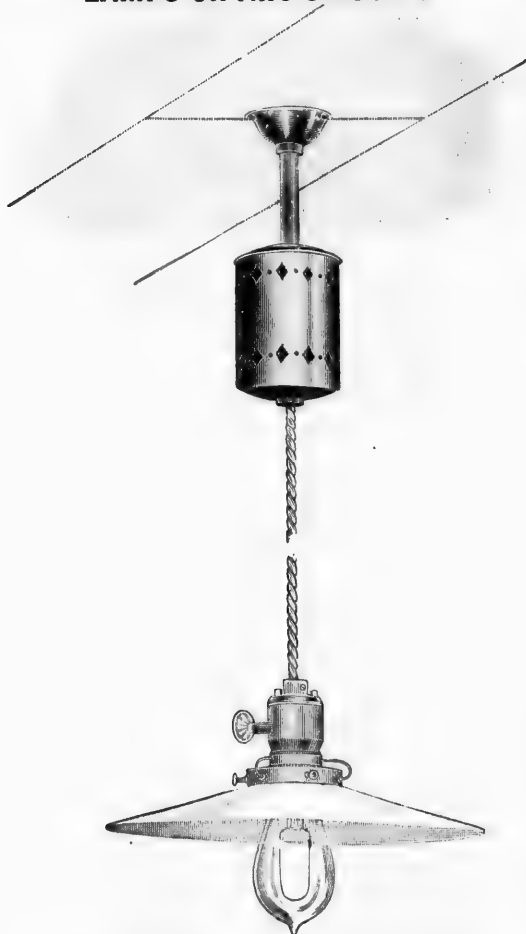
We call your special attention to a new departure in Electric Lighting made by this Company. We have lately perfected a new Dynamo of this system for operating small "sub-divided" arc lights of 800 nominal candle power.

We confidently believe that we can to-day offer you the most economical, noiseless and steady arc light known.

We guarantee to produce these lights on less than one-third of a horse-power each, and the economy in the introduction of this dynamo as compared with incandescent lighting can readily be seen. In producing a light of this power and cheapness we believe that we fully overcome the objections heretofore raised to the use of arc light in machine shops, stores and factories, as the lesser cost per light and the economy in running will enable the purchaser, by putting in a larger number of the subdivided arcs, to thoroughly distribute the light, thus overcoming the shadows from the more powerful arc lights, and thoroughly light his premises at much less expense than by any incandescent system. The subdivided arc will also, in our opinion, supercede the 1,200, and 2,000 c. p. lights for town and village lighting where shade trees have made economical lighting by lights of large candle power an impossibility.

We continue to make as before, our 6, 8 and 10 Ampere Dynamos and Lamps, with the same attention to mechanical and electrical detail, good work and superiority of finish, that has in the past secured for them a national reputation.

INDIVIDUAL CUT-OUT FOR INCANDESCENT LAMPS ON ARC CIRCUITS



PATENTED JULY 25TH, 1887, AND APRIL 25TH, 1888.

The only Automatic Cut-Out that is perfectly reliable under all circumstances. Any or all of the lamps may be turned off or on at will.

Guaranteed to protect circuit and other lamps, should lamp filament give out from long usage, or should lamps be removed during daytime.

SIMPLE.—No adjustment or cut-out required. Cost of wiring nominal, as, if desired, only one or two wires at most need enter any room, no matter how many lamps in use. Thus the wiring has a much neater appearance than when separate wires are run to each lamp from a wall controller, as in some other systems.

ECONOMICAL.—Incandescent lamps can be run on Arc circuits at any point and with less power than by any other method.

SAFE.—No danger from over heated resistance. Complies with the Board of Underwriter's rules.

MANUFACTURED BY

THE BALL ELECTRIC LIGHT CO., (LIMITED)

57 ADELAIDE ST. WEST, TORONTO, ONT.

BALL INCANDESCENT SYSTEM

IMPROVED

Although, from an economical view of the various methods of lighting, we have always, and do still recommend the Arc system as preferable to the Incandescent system for lighting all large areas, such as stores, halls, streets, and factories with large work rooms; yet there are many places where Incandescent lights would be preferable, on account of securing a greater subdivision of the electric current, which makes the **Incandescent system** desirable for lighting public buildings, hotels, flour and cotton mills, residences, mines, steamboats, etc.

To supply the demand for Incandescent lights, we have recently perfected apparatus for Incandescent lighting, which we can confidently recommend to the public as being more simple, economical, safe and reliable than any other Incandescent system.

Our dynamos for Incandescent lighting are **self-regulating**, without the aid of any mechanical device or attachment. Any desired number of lamps can be run from one up to the capacity of the dynamo. **When lamps are turned off there is a corresponding reduction of power.**

We guarantee 10 to 16 candle power lamps to the horse power, and with the new economy lamp, 14 to the horse power.

For design and mechanical perfection of construction, our dynamos are not excelled. They take up less floor space than any other make, and they run cool and noiseless.

Our lamps, sockets and wiring appliances, are perfect in construction, design and insulation, thus ensuring safety from fire.

We have a skilled erection force, competent to install any sized plant, either Arc or Incandescent, and guarantee first-class work.

Estimates of complete Incandescent plants, including erection, furnished upon receiving plan of building, showing location and number of lamps required.

ELECTRIC MOTORS

We build efficient electric motors to give any horse power desired, constructed either for constant current or constant potential circuit. Motors furnished with either **hand or automatic regulation** as required.

EM

EXTRACTS FROM ELECTRICAL PAPERS

Test at Chicago Exposition

Electrical Review, Oct. 16th, 1886.

Prominent at the Industrial Exhibition is a Ball dynamo, and a system of twenty Ball lamps. In addition to the arc circuit proper, a group of incandescent lights is arranged to be substituted for one or more of the larger lamps. The plant, which is solely an exhibit, is driven by a 40 horse-power Ide & Son engine, which has a new arrangement in the form of a horse-power indicator, the truthfulness of which is capable of demonstration at any time while the engine is in motion.

Cards taken by Mr. A. L. Ide are figured by him, and given as follows :

Friction 9x12 inch engine and dynamo and power required for 20 arc lights.....	17.12 H.P.
Friction card, engine alone	4.30 "
	12.82

or $\frac{1}{10}$ horse-power per light per hour, including friction of dynamo, or the power required at pulley of dynamo.

Friction card of engine and dynamo	6.00 H.P.
Friction card of engine	4.30 "
	1.70 H.P.

12.82
1.70

11.12 H.P.

or $\frac{6}{10}$ H.P. per lamp, deducting the friction of dynamo.

The Ball Machine is Second to None

Extract from the London Electrical Review (the principal English electric journal), of April, 1883.

By dividing a given quantity of wire into two armatures a considerable advantage is evidently gained, for the heating of the wire must necessarily be less, and therefore the internal circuit does not consume so much energy.

Indeed, according to Mr. Robert Sabine's report, the h. p. accounted for in the external circuit appears to be in excess of the figures given by the committee of the late Electrical Exhibition held in Paris, for various types of well-known machines, and from the tests made public it is evident that the Ball machine is second to none.

The Ball Light at Providence, R.I.

Electrical World, November 14th, 1885.

One of the most successful installations of the Ball system in the New England States is the plant at the Providence Worsted Mills, Providence, R. I. In the early part of last spring, Mr. Charles Fletcher, the owner of the above-named mills, consented that a small plant of 20 arc lights be installed simply on trial, and so well pleased has that gentlemen been with the system, that he has increased the number of the lights (same system) from time to time, until the plant now comprises the following: One 30-light dynamo machine, running 35 lights; one 20-light machine, running 19 lights; one 20-light machine, running 21 lights; and one 20-light machine, running 20 lights; making a total of 95 arc lights of the Ball system now being in constant use. Mr. Fletcher, on being questioned, without any hesitancy said: "The Ball system, in use in my mills since last spring, has proven all that is claimed by its promoters, and has not only afforded an efficient and reliable light, but has given thorough satisfaction." The engineer of the same mills, Mr. Nathan Slater, who enjoys not only the confidence and esteem of his employer, but is the possessor of a reputation for being a skillful mechanic, as well as a competent engineer, has had exclusive control of the Ball plant in the Providence Worsted Mills since the day of his installation, and his opinion is worthy of mention.

In reply to queries put to him in regard to the Ball system, he remarked as follows: "I have been in charge of these dynamos from the very day that they were placed in this mill, and have never experienced the least amount of trouble with either of them. Having had considerable experience (previous to taking charge of the Ball dynamos) around mills where various systems of electric lighting have been in use, I consider myself competent to give an unbiased opinion of a good electric lighting system, more especially after being in charge of same for nearly nine months. I take pleasure in saying for the unipolar dynamo of 20 lights, it runs easily and smoothly, and can do the work required just as well with a two-inch belt as with a larger one.

"Have had all four dynamos at times running steadily for 16 hours, and no excessive heat could be discerned on the armatures or fields of either.

"They derive their power from a 350 horse-power engine made by Geo. M. Corliss, of Providence, which also drives 152 looms for weaving cloths, four sets of cards, three sets of jacks, together with all the machinery used in cleaning, scouring and finishing.

"The belting to each dynamo runs from off a counter-shaft, and although each belt is laced, yet the arc lights show no imperfection, always burning clearly and steadily without a hiss or flicker. My confidence in the unipolar dynamo is deep-reached and sincere."

Messrs. Taft, Weedon & Co., of the Weybossett Mills, only a short distance from the Providence Worsted Mills, learned of the satisfactory performance of the Ball lights at the works of their neighbor, and soon made up their minds to have the same system, and recently had a 20-light unipolar dynamo installed in their engine room, and are now running it from the ordinary shafting of the mill by a 2½ inch belt. At present only 20 arc lights are being used, and these are giving satisfaction.

Electrical World, March 13th, 1886.

The Ball Electric Light Company have received the contract for the installation of its system of both arc and incandescent lighting on the premises of the Dunnell Manufacturing Company, Providence, R.I. The plant will consist of 40 arc lights, and 50 incandescent lights of 16 candle-power each, the latter being run off the arc circuit.

Unquestionable Evidence of Perfect Satisfaction

From the Electrical World of April 30th, 1887

The Wunder & Abbott Illuminating Company, who now have plants at 103 State Street and 156 Fifth Avenue, are erecting a third plant at 188 Washington Street. This plant will be the largest of the three, and will have a capacity of 500 arc lights. They will use the Ball Electric Light Company's system, two Buckeye and one Westinghouse engines, Munson's Belting, and three tubular boilers. This Company's State Street and Fifth Avenue plants will also be increased. The State Street plant has at present seven Ball dynamos, three Westinghouse 50 h. p. engines, and one 50 h. p. Ide engine. The Fifth Avenue plant has four Ball, one Brush and two Fuller dynamos, with Munson's belting, and Buckeye engine. The State Street and Fifth Avenue plants together now have a capacity of 350 lights, so that when the Washington Street plant is completed (and it is now fully half-way to completion) the Wunder & Abbott stations in Chicago will have a capacity of 850 arc lights.

Electric Light and Water-Gas from the same Plant. Successful Installation at Cottage City, Martha's Vineyard, Mass.

Special Correspondent of the Electrical Review.

The electric plant consists of two 30-light Ball unipoiar dynamos, driven by a slide-valve engine manufactured by Pitkin Bros., Hartford, Conn. Two separate circuits are run, amounting in all to about four miles of wire. The current developed is eight amperes, and an ingenious indicator, consisting of a vertical solenoid, enables the current to be exactly regulated. In circuit there is included a lamp of peculiar construction, which is placed in the dynamo room. When, by an increase in the speed of the engine, or by turning off lights in the circuit, the current increases, the mechanism of the signal light causes the carbons to separate and form an arc, thus introducing sufficient resistance to keep the current uniform. The attendant, noticing the increased brilliancy of the signal light, can, by moving the brushes, reduce the current until it no longer burns. Variations of speed and load are thus compensated for automatically, and as soon as the position of the brushes is changed, an amount of power proportionate to the amount of lights out is saved. The power consumed is **six-tenths** of a horse-power for each 2,000 candle-power lamp. A six ampere machine of the same type has given, in a recent test, **two and one-quarter** 1,2000 candle-power (half arc) lamps **per horse-power**, as measured by the dynamometer.

The steadiness of the light was a subject of much favorable comment on the part of towns-people and summer visitors, and the result is the more remarkable if we consider that the motive power was a slow stroke throttle governor engine. This installation deserves especial notice as a pioneer in the field of combined electric and gas plants. The utilization of the waste heat of a gas works for the generation of motive power for a dynamo has here been first realized. The station is so conveniently arranged that one man can manufacture gas till dark, and then run the engine and dynamos, so simple and easy is their management. In many sections of the West, bituminous slack can be bought for 50 cents per ton, and at this price for fuel arc lights and fuel gas can be produced at an extremely low rate.

Cottage City, with the combination of gas and electric lights, will become one of the most attractive

seaside resorts on the Atlantic Coast. The Baptist camp meeting at the Highlands, and the Methodist camp at Cottage, will be thoroughly illuminated with arc lights. The tabernacle and grounds of the Methodist camp have twelve lights, and whatever may be said on the rostrum, it may be confidently affirmed that the arc lights will not hiss.

The Ball System Supercedes, but is Never Superceded

From LEWIS F. LYNE, Superintendent of the Jersey City Electric Light Co.

Our customers are satisfied with our lights, and pay their bills in full, making no complaints. We wasted about \$25,000 in trying to make the Fuller-Wood, or so-called American system, work, but it failed to develop any merit, and was therefore abandoned. We have nine Ball dynamos in use to our entire satisfaction, and shall order more very soon. We are now running 275 Ball arc lamps, 91 of which are for the city.

We Run Day and Night Here

From W. S. Wright, Electrical Engineer, New York Aqueduct Works.

ARDSLEY, Westchester Co., N.Y.,

May 15th, 1886.

The ten-light dynamo has been received and is doing good work. The dynamo working next to it has been in operation just one year. In that time it has run without a breakdown, repairs or stoppage of any kind, and is in first-class order. We run day and night here, and are supposed to have no shut-down from one year's end to another.

Tunnel work on dynamos and lamps is of the worst kind to which they can be subjected, owing to the frequent shifting of lamps, dampness and the unavoidable grounding of wires, and from our own observation and experience I have no hesitation in declaring it the *very best* dynamo manufactured. The different inspectors and engineers say we have the best lights along the line. Hoping the machine just sent may give the same satisfaction.

= TESTIMONIALS =

OF RECENT DATE FROM PARTIES USING BALL ELECTRIC LIGHT APPARATUS



BOWMANVILLE ELECTRIC LIGHT CO.,
Bowmanville, Ont., Feb. 9, 1888.

We are well pleased with your dynamos and lamps.
We know it is the best system now in use in Canada.

W. J. JONES, *Secretary.*

THE HAMILTON BRIDGE AND TOOL CO.,
Hamilton, Ont., Feb. 9, 1888.

Our works are fitted up with the Ball system of electric lighting, and we have pleasure in stating that the same has given us *every satisfaction*. The *power required* to drive dynamos is *very moderate*, and we have *no trouble* in keeping the apparatus in perfect working order *without* employing *expert* help. Our shop engine has been a good many years in use and is of the ordinary side valve type, and we drive the dynamo from it, and can testify to the *uniform* and *steady* burning of the lights. We consider your system *specially adapted for manufacturing purposes*.

C. TEIPER, *Manager.*

AYLMER ELECTRIC LIGHT CO.,
Aylmer, Ont., Feb. 15, 1888.

The 35-light plant purchased from you has now been running about fourteen months, and has given us *entire satisfaction*. We consider it the best system of Arc lighting we have yet seen.

MT. FOREST ELECTRIC LIGHT CO.,
Mt. Forest, Ont., Feb. 13, 1888.

We are very much pleased indeed with the 25-light Ball plant bought from you. Strangers say that we have the best light in the country. We have been running about fifteen months.

WM. KINGSTON, *President.*

NORTHUMBERLAND PAPER CO.,

Campbellford, Ont., Feb. 16th, 1888.

We have been running your system of *Electric Light* for about two years and it has given us entire satisfaction. It has been *no trouble or expense* to us, and you must remember that we *run it constantly from twilight till broad day again*, every working day in the year. We do not see now how we managed without it before, and would not be without it now for twice what it cost us.

EDMUND G. BURK, *Prop.*

RENFREW ELECTRIC LIGHT CO.,

Renfrew, Ont., Feb. 9, 1888.

We have the honor to state that we have been using your system of Arc lighting for over two years, and everything about it has given us perfect satisfaction. So far we have seen no system for which we would for a moment think of exchanging.

A. A. WRIGHT & CO.

UXBRIDGE ELECTRIC LIGHT CO.,

Uxbridge, Ont., Feb. 10, 1888.

We have used the Ball system of electric lighting for ten months, and consider that we purchased the *best, simplest, most reliable and economical* system in the market, after a careful examination of the various makes.

I. J. GOULD, M.P.P.

TOWN OF ORILLIA,

Orillia, Ont., Feb. 13, 1888.

I take great pleasure in stating that the three dynamos I have had in charge since last year are giving perfect satisfaction. The whole plant is giving general satisfaction to all parties using the light. I have no trouble in running the dynamos. They run perfectly cool, and I never need to shift any of the brushes during the night's run.

A. KERR.

THOROLD, May 10th, 1883.

THE BALL ELECTRIC LIGHT CO.

Toronto, Ont.

GENTLEMEN,—I have the honor of handing copy of report passed unanimously by our Council, in reference to the electric plant furnished by you for our Corporation.

Very truly yours,

(Signed) WILLIAM McCLEARY, *Mayor*.

Report of Committee re Electric Light.

To the Mayor and Council of the Town of Thorold:

Your Committee on Electric Light beg leave to present this report, in reference to the Electric Light plant purchased for the town.

Immediately after receiving instructions from this Council your Committee advertised for tenders for furnishing a complete Electric Light plant of 50 Arc lights of 2,000 candle power each. We received proposals from all the leading Electric Light Companies in Canada and the United States.

After making a very careful inquiry into the merits of each system, as well as visiting several cities and towns where some of the different systems were in operation, we decided to purchase from the Ball Electric Light Co. of Toronto, two 25 light dynamos, with all the necessary equipment and apparatus, put up and run to our approval for 30 days.

That your Committee made a wise choice in the system, and that the Council, in adopting the recommendation of the Committee, acted in the best interests of the Corporation, stands without question. The plant has now been in operation about three months, and we have yet to hear one word of dissatisfaction, either from those who have the light in their places of business, or from the citizens in regard to the street lights.

Our town has been visited by several gentlemen interested in electric lighting, and the dynamos and lights have been examined by them, and all who have thus examined have pronounced the light superior to any they have seen. The machines are less cumbersome, more easily operated, and better results obtained than from any other.

We would recommend that the Mayor be authorized to issue his cheque in favor of the Ball Electric Light Company for \$400.00, this being the balance due them on the purchase contract for the plant.

All of which is respectfully submitted.

WILLIAM McCLEARY, *Mayor and Chairman*.

WILLIAM WILLIAMS.

LESLIE McMANN.

GEO. H. WILLIAMS.

GEO. TURNER.

Passed in Council this 8th day of May, 1888.

GANANOQUE ELECTRIC LIGHT CO.,

Gananoque, Ont., Feb. 14, 1888.

We have much pleasure in bearing testimony to the efficiency of your system of electric lighting. Before we purchased the Ball plant we investigated it and two or three others, and came to the conclusion that we preferred your system on account of a *uniform* and *steady* light. After a year's use of the system we are more than pleased with it, and those of our customers who have compared with lights elsewhere claim that they are being furnished with a light *superior* to any they have seen. With the exception of an accident, which was no fault of the machine, we have had *no repairs* to put upon it.

TAYLOR & WALTON, Props.

THE AMERICAN INSTITUTE OF THE CITY OF NEW YORK, Chas. Wager, Gen. Supt.:—I take great pleasure in certifying to the fact that the forty-two arc lights furnished by you in the machinery department of this exhibition have proven entirely satisfactory. So far as I am able to judge, the light is certainly better, in that it is steadier, softer, and at the same time more brilliant, than any light ever furnished on these premises.

N. Y. & SEA BEACH RAILWAY CO., Alrick H. Man, Managing Director and Treasurer:—..... The Ball lights give the utmost satisfaction.

OAKLAND HOTEL, St. Clair Mineral Springs, Mich., Wm. S. Hopkins (Telegram):—Plant in operation last night. It is the most beautiful and satisfactory arc light in the world. I congratulate myself for adopting it."

GOLDIE & McCULLOUGH, Galt, Ontario, Can.: Has given us entire satisfaction.... We repeatedly run the lights from dark to daylight..... Before using the "Ball," we had the ——— Incandescent System, but found it too much trouble and cost to continue its use.

ONTARIO BOLT CO., Toronto, Ontario, Can.: Satisfactory. We consider it the best light obtainable for our purpose, and much cheaper than any other.

DOMINION BRIDGE CO., Toronto, Ontario, Can.: Perfectly satisfactory. No repairs have been needed.... But little attention given to dynamo and the cost of lighting is practically only the cost of carbon and fuel.

GRIMSBY CAMP GROUND CO., Grimsby, Ontario, Can.: Your promise to illuminate our grounds in a superior manner has been carried out by you in a way exceeding our most sanguine expectations. Our committee carefully investigated the various systems at Toronto, Buffalo, Chatauqua and Cleveland, and now unhesitatingly endorse your statements regarding the superiority of the Ball system of Electric Lighting.

PORT HOPE ELECTRIC LIGHT CO. Port Hope, Ontario, Can.: Have not found any reason for complaint. The plant has worked with a brilliancy and steadiness that causes almost universal comment from strangers coming to our town from places where other systems are in use.

JOHN DOTY ENGINE CO., Toronto, Ontario, Can.: Dynamo and lamps have given us entire satisfaction. . . . The dynamo simply needs to be started and stopped. . . . Our output has increased considerably since adopting the Electric Light to replace gas.

JERSEY CITY ELECTRIC LIGHT CO., Jersey City, N. J. (Lewis F. Lyne, Supt.): I consider your system the most economical of any I have ever used or seen. . . . While our other machines and lamps have given us an endless amount of trouble, yours have taken care of themselves. . . . Our machines during the past year have only required the turning up of the commutators, and the lamps only occasional oiling. Thus our repairs have cost practically nothing.

The above Company have now some 200 Ball Arc Lights in circuit. An armature of a "Fuller" dynamo in their station was recently burned through the wires of outside circuit being brought into contact by men engaged in moving a building. Our competitors are reporting it to have been a "Ball" dynamo. No armature of a "Ball" dynamo has ever yet been burned.

WATERLOO WOOLLEN MANUF'G CO., Waterloo, N.Y. (A. M. Patterson, President) says: . . . Our opinion in regard to the thirty-light dynamo, purchased after examination and observation of a number of different systems, is that we have seen no reason to regret our selection. Of all the systems we have seen this is the simplest in operation. The attendants have no knowledge of electricity, nor have they had any previous experience, yet we never had one moment's trouble.

CLYDE BLEACHING AND PRINTING WORKS (S. H. Greene & Sons), Riverport, R.I.: The thirty-light dynamo we purchased from you last fall has given entire satisfaction, and the care required has been very little to keep both the dynamo and lamps in good order. We drive it from the main shaft through a 2½ inch cotton leather belt, running rather less than 5,000 feet per minute, and the belt has been laced only once since the machine was started. The light is extremely pleasing, especially to our machine printers, who require for their work only the very best of light.

NATIONAL WORSTED CO., Olneyville, R. I.: Has proved entirely satisfactory. . . . One great point in our light is, they are steady and do not flicker, as many other kinds of lights do.

Hope,
complaint.
readiness
strangers
ems are

o, Can.:
ion....
pped...
adopting

City, N.
tem the
n.....
en us an
of them-
ave only
and the
ave cost

Ball Arc
dynamo in
s of out-
gaged in
ing it to
"Ball"

oo, N.Y.
inion in
er exam-
systems,
election.
aplest in
of elec-
ce, yet we

s (S. H.
dynamo
satisfac-
to keep
e drive it
a leather
ute, and
hine was
cially to
only the

I.: Has
nt in our
any other

HOTEL MADISON, New York City: Has never failed; has not stopped or been stopped since starting. No repairs, and is tended (or rather started and stopped daily) by our ordinary hotel engineer. Lamps burn without interruption, and are the steadiest in New York City, and we think we have the best lighted house in the city. The lights are pure white, mellow and perfectly noiseless and steady; never have a hiss or splutter. We expect to increase the plant and light up our neighbors. We are lighting the Metropolitan Opera House now.

JOSEPH SCATCHARD'S SON'S WOOLLEN MILLS, Germantown, Pa.: Satisfactory. We have another system in our mill. The "Ball" takes less power, and we see no difference in the light.

DOMINION BARB WIRE CO., Montreal, Can.: Gives good satisfaction.

MACULLAR, PARKER & CO., Boston, Mass.: We are much pleased with the working of the thirty-light dynamo which you put in for us in October last. . . . The expense of repairs is very slight, and the light furnished is *perfectly satisfactory*, being *steady* and *noiseless* to a greater degree than any other style of light we have ever used. The power required is but six-tenths of one horse per light, as indicated by careful testing. In fact, we may say that we are *perfectly satisfied* with the system; and hope that with the second dynamo of thirty lights, which has just been arranged for, we shall have a perfectly well lighted store.

WEYBOSSETT MILLS, Providence, R. I.: Excellent service. The machine has met your representations. The light is clear and steady, and is liked by our operatives.

RIVERSIDE AND OSWEGO MILLS, Providence, R. I.: Mr. R. T. Robinson, Electrician, writes: It does its work well with a three-inch single belt. We shall shortly weigh the power, when will give you the result. . . . Have watched nearly all the other systems very closely, and thus far consider the "Ball" the best in the market. The light is clear, very steady, lamps not likely to get out of order, can run as few as you wish, and by an increase of speed burn a correspondingly increased number of lamps. The one here is a 25 lighter; we burn 32 and do not feel that we have reached the limit yet.

WM. M. BENT & Co., Chicago, Ill.: Mr. Clemens Brinkmann, of this firm, says: Having visited New York, Jersey City, Philadelphia and Boston, besides corresponding with several parties who have already used the Ball system for some time, I fail to find a single case of failure or accident of any kind. . . . In one case the run was thirty-six days of 24 hours each, without a single interruption of the current, and the stop was then made simply to clean up.

THE BAY STATE SUGAR REFINERY, Boston, Mass. :
The engineer—a man of much experience with other
incandescent systems—says : “There is no use in talking,
it lays over them all.” It is self regulating, perfectly,
from one to two hundred lights. No resistance box or
traps of any kind.

GLEN COVE MANUFACTURING Co., Glen Cove, N.
Y. : E. E. Duryea, Superintendent, says : Having some
years since tried the electric light in our works without
any satisfactory result, we finally installed one of your
plants, and gladly declare it the best system that has
come under our observation. We would not, and, from
an economical point of view, could not, dispense with
its use.

MOSS PARK SKATING AND CURLING RINK Co.,
Toronto, Ont. : We are much pleased with the electric
dynamo and lamps you furnished us in 1883, and are
satisfied that we purchased the best system in the market,
after a careful examination of them all.

INGERSOLL ROCK DRILL Co., New York City :
Has given entire satisfaction in every way.

CENTENNIAL BREWING Co., Philadelphia, Pa. : It
has worked to our satisfaction We have observed the
lights of other companies, and find that the result of ours
is superior.

SERGEANT & CULLINGWORTH Co., New York City :
We have had in our works during the last four years one
of your Electric Light plants. It has never given us any
trouble, and lights our shop to our entire satisfaction.
The wear of the plant, we might say, is nothing.

THE CLARK INSULATED ELECTRIC WIRE Co., Phila-
delphia, Pa. : The Ball dynamo made for our Bristol
factory some months ago operates very successfully ten
arc and twenty-four incandescent lamps in separate circuits
at the same time. It seems to be always ready, although
it is, of necessity, in the old rubber room, the most dusty
apartment of our works.

THE CYCLORAMA, Philadelphia, Pa. : Very satisfac-
tory. Never have had any trouble with lamps or dynamo
in the six months running. Your electric system is *per-
fect* in every respect. The light is very powerful, very
white, and steadier than any other arc light I have ever
employed. The motto of your Company ought to be
“White and steady light.”

McILVAIN & SON'S BOILER PLATE WORKS, Reading,
Pa. : We think better of this machine than any other
that we have heard of

JONES, DENTON & Co., New York Aqueduct Works :
Satisfactory.

IN S

Aylm
Almo
Brant
Bellev
Brock
Berlin
Bowm
Carlet
Chan
Clarry
Chath
Crow
Domi
Domi
Domi
Doty
Frede
Guelp
Gana
Grim
Goldi
Ham
Hanl
Josep
King
Lond
Long
Mt. I
Mun
Moss
Mass
McD
New
Napa
Nort
Onta
Osha
Pert
Port
Polso
Peni
Paris
Ren
Stra
Sim
Tow
Tow
Uxb
Wal

PARTIAL LIST OF BALL PLANTS

IN SERVICE IN CANADA AND UNITED STATES FOR PUBLIC AND PRIVATE ILLUMINATION

NOTE THE LARGE NUMBER OF INCREASED PLANTS

Aylmer Electric Light Co.	Aylmer, Ont.
Almonte Electric Light Co. (increased)	Almonte, Ont.
Brantford Electric Light Co. (increased)	Brantford, Ont.
Belleville Gas Co. (increased)	Belleville, Ont.
Brockville Gas Co.	Brockville, Ont.
Berlin Gas Co. (increased)	Berlin, Ont.
Bowmanville Electric Light Co. (increased) ...	Bowmanville, Ont.
Carleton Place Electric Light Co.	Carleton Place, Ont.
Chandler Electric Light Co.	Halifax, N.S.
Clarry Wool and Mfg. Co. (increased)	Markham, Ont.
Chatham Gas Co.	Chatham, Ont.
Crowe Iron Works	Guelph, Ont.
Dominion Bridge Co.	Montreal, Que.
Dominion Bridge Co.	Toronto, Ont.
Dominion Barb Wire Co. (increased)	Montreal, Que.
Doty Engine Co. (increased)	Toronto, Ont.
Fredericton Gas Co.	Fredericton, N. B.
Guelph Gas Co. (increased)	Guelph, Ont.
Gananoque Electric Light Co. (increased)	Gananoque, Ont.
Grimsby Park Co. (increased)	Grimsby, Ont.
Goldie & McCulloch (increased)	Galt, Ont.
Hamilton Tool and Bridge Co.	Hamilton, Ont.
Hanlan's Point Ferry Co. (increased)	Toronto, Ont.
Joseph E. Seagram, Distiller	Waterloo, Ont.
Kingston & Pembroke Railway Co.	Kingston, Ont.
London Electric Light Co. (increased)	London, Ont.
Long Branch Park Co.	near Toronto, Ont.
Mt. Forest Electric Light Co. (increased)	Mt. Forest, Ont.
Munson, C. A., Steam Dredge	Belleville, Ont.
Moss Park Skating Rink Co.	Toronto, Ont.
Massey Mfg. Co.	Toronto, Ont.
McDougall, A. & Son, Distillers	Halifax, N.S.
Newmarket Electric Light Co. (increased)	Newmarket, Ont.
Napanee Paper Co.	Napanee, Ont.
Northumberland Paper Co. (increased)	Campbellford, Ont.
Ontario Bolt Works Co. (increased)	Toronto, Ont.
Oshawa Electric Light Co. (increased)	Oshawa, Ont.
Perth Electric Light Co. (increased)	Perth, Ont.
Port Hope Electric Light Co. (increased)	Port Hope, Ont.
Polson Iron Works Co., Limited	Toronto, Ont.
Peninsular Park Hotel Co.	Barrie, Ont.
Paris Electric Light Co. (increased)	Paris, Ont.
Renfrew Electric Light Co. (increased)	Renfrew, Ont.
Stratford Gas Co. (increased)	Stratford, Ont.
Simcoe Electric Light Co. (increased)	Simcoe, Ont.
Town of Orillia (increased)	Orillia, Ont.
Town of Thorold	Thorold, Ont.
Uxbridge Electric Light Co. (increased)	Uxbridge, Ont.
Walkerton Electric Light Co. (increased)	Walkerton, Ont.

Wunder & Abbott Illuminating Co. (increased) Chicago, Ill.
 Pullman Palace Car Co. (increased) Pullman, Ill.
 Hartford Electric Light Co. (increased) Hartford, Conn.
 Jersey City Electric Light Co. (increased) Jersey City, N.J.
 Ingersoll Rock Drill Co. (increased) New York, N.Y.
 Ball Illuminating Co New York, N.Y.
 Erie Basin Dry Docks Brooklyn, N.Y.
 Reading Iron Works Reading, Pa.
 Cottage City E. L. & Gas Co. (increased) Martha's Vineyard, Mass.
 Lansdale Electric Light Co. Lansdale, Pa.
 Plymouth Electric Light Co. Plymouth, Mass.
 Portsmouth Electric Light Co. (increased) Portsmouth, N.H.
 Rochester Electric Light Co. (increased) Rochester, N.H.
 Scranton Electric Light Co. Scranton, Pa.
 Spencer Electric Light Co. (increased) Spencer, Mass.
 National Worsted Mills (increased) Olneyville, R.I.
 Phoenix Woollen Mills Greenwich, R.I.
 Riverside and Oswego Mills (increased) Providence, R.I.
 Clyde Bleach and Print Works. Riverpoint, R.I.
 Waterloo Woollen Mfg. Co. (increased) Waterloo, N.Y.
 Scatchard Woollen Mills Germantown, Pa.
 Seyfert Rolling Mills. Seyfert, Pa.
 Plymouth Rolling Mills. Conshohocken, Pa.
 Iron Bay Manufacturing Co. (increased) Marquette, Mich.
 Traction Car Co. Philadelphia, Pa.
 Brill Car Co. Philadelphia, Pa.
 Boise Car Wheel Co. Scranton, Pa.
 Hotel Madison (increased) New York City.
 Oakland Hotel St. Clair, Mich.
 Lake Hapatcong Hotel Co. (increased) New Jersey.
 Cable Railroad Co. Philadelphia, Pa.
 Duryea Starch Co. (increased) Glen Cove, N.Y.
 American Optical Co. Southbridge, N.H.
 Pfannkuche Manufacturing Co. Rochester, N.H.
 Godfrey Pocket Co. Plymouth, Mass.
 New York Lumber Auction Co. New York City.
 Clark Insulated Wire Co. Bristol, Penn.
 Campbell & Hitt. Bristol, Penn.
 Beaver Head Hydraulic Mining Co. Idaho.
 Tamarack Copper Mfg. Co. (increased) Houghton, Mich.
 Saguache Tunnel, Wm. A. Douglass and Co. (increased)
 Leadville, Colo.

Orman, Cooke & Co. Leadville, Colo.
 Cascade Tunnel, Nelson Bennett (increased) Washington Ter.
 Lion Brewery Philadelphia, Pa.
 Centennial Brewery. Philadelphia, Pa.
 Jorden, Marsh & Co. (increased) Boston, Mass.
 MacCuller, Parker & Co. (increased) Boston, Mass.
 Grommes & Ullrich. Chicago, Ill.
 Wm. M. Bent & Co. (increased) Chicago, Ill.
 Webster & Son. Philadelphia, Pa.
 H. A. Kimball. Manton, R.I.
 Geo. S. Crawford Cincinnati, O.
 The "Cyclorama" Brooklyn, N.Y.
 The "Cyclorama" (increased) Philadelphia, Pa.
 The "Cyclorama" Boston, Mass.
 Smith & Brown, Contractors (increased) ... N.Y. Aqueduct Works.

cago, Ill.
 man, Ill.
 d, Conn.
 ity, N.J.
 rk, N.Y.
 rk, N.Y.
 yn, N.Y.
 ling, Pa.
 rd, Mass.
 dale, Pa.
 h, Mass.
 th, N.H.
 er, N.H.
 nton, Pa.
 er, Mass.
 ille, R.I.
 ich, R.I.
 nce, R.I.
 int, R.I.
 oo, N.Y.
 own, Pa.
 yfert, Pa.
 cken, Pa.
 te, Mich.
 phia, Pa.
 phia, Pa.
 nton, Pa.
 rk City.
 ir, Mich.
 w Jersey.
 phia, Pa.
 ve, N.Y.
 ge, N.H.
 er, N.H.
 th, Mass.
 rk City.
 ol, Penn.
 ol, Penn.
 . Idaho.
 on, Mich.
 lle, Colo.
 lle, Colo.
 gton Ter.
 phia, Pa.
 phia, Pa.
 on, Mass.
 on, Mass.
 cago, Ill.
 cago, Ill.
 phia, Pa.
 nton, R.I.
 innati, O.
 lyn, N.Y.
 phia, Pa.
 on, Mass.
 ct Works.

Jones, Denton & Co.....N. Y. Aqueduct Works.
 Paige, Carey & Co.....N. Y. Aqueduct Works.
 McLaughlin, Reilly & Co. (increased)....N. Y. Aqueduct Works.
 Brown, Howard & Co. (3 plants)N. Y. Aqueduct Works.
 Isaac McHose & SonsNorristown, Pa.
 Combination Iron & Steel CoChester, Pa.
 S. H. Green & Son (increased).....Riverport, Pa.
 Manz & Co.....Chicago, Ill.
 Order of CincinnatusCincinnati, Ohio.
 W. A. Knapp.....Beloit, Wis.
 Sanderson Bros.' Steel Works (increased).....Syracuse, N.Y.
 C. M. Groff.....Reading, Pa.
 Weybossett Mills (increased).....Providence, R.I.
 N. Y. Lumber Auction Co.....New York City.
 Glen Cove Mfg. Co. (increased).....Glen Cove, N.Y.
 McDonald & Bros.....La Crosse, Wis.
 Boston Steam and Power Co.Boston, Mass.
 South Pennsylvania Railway Co.....Ray's Hill, Pa.
 Baker Electric Co.....Chicago, Ill.
 Clark's Cove Guano Co.....New Bedford, Mass.
 Tamarack Mining Co. (2nd plant).....Opechee, Mich.
 Granite Mills.....Pascoag, R.I.
 McIlvain & Sons' Boiler Plate WorksReading, Pa.
 Parkhill Manufacturing Co.....Fitchburg, Mass.
 Cleghorn MillsFitchburg, Mass.

INCANDESCENT PLANTS

L. C. Porter Milling Co.....Winona, Minn.
 Winona Lumber Co.....Winona, Minn.
 Iron Silver Mining Co. (Arc and Incandescent)Leadville, Col.
 Jno. A. Roebling's Sons Co.Trenton, N.J.
 Pennsylvania Co. Depot, Shop and Tracks.....Ft. Wayne, Ind.
 T. R. BentonFairchild, Wis.
 A. C. Foster.....Fairchild, Wis.
 R. L. BerglandMinneapolis, Minn.
 Galaxy Mills.....Minneapolis, Minn.
 Bay State Sugar Refining Co.....Boston, Mass.
 Steamboat CarmonaOntario Navigation Co.
 St. Clair Tunnel Co., On Grand Trunk Railway, Sarnia, Ont.

We manufacture and supply
Arc and Incandescent Dynamos and Lamps,
Electric Motors, Switch-Boards for stations,
Cut-Offs and Individual Cut-Outs
for Incandescent lighting
on Arc Circuits.

Globes, Carbons, Insulators, Line Wire, Etc ,
constantly in stock.

LIST OF ARC DYNAMOS

Designation of Machine.	No. Lights 10 amp.	No. Lights 8 amp.	No. Lights 6 amp.	No. Lights 800 c. p., 4 amp.	Horse Power at Pulley of Dynamo.	Width of Single Belt in inches.	Belt Speed Required.	Weight of Dynamo.	SIZE IN INCHES.		
									Length.	Width.	Height.
A	...	3	...	...	2.0	1	42	160			
B	...	5	...	...	3.5	1	12	300	2' 9"	1' 2"	1' 5"
C	8	...	...	...	6.5	1	12	530	3' 3"	1' 3"	1' 9"
C	...	10	...	...	6.3	1	12	530	"	"	"
C	...	...	14	...	7.0	2	2	530	"	"	"
C	...	...	...	25	8.0	2	2	530	"	"	"
E	16	...	...	...	12.0	2	12	780	3' 10"	1' 4"	1' 10"
E	...	20	...	...	12.5	2	12	780	"	"	"
E	...	...	26	...	13.0	2	12	780	"	"	"
F	20	...	...	...	15.0	3	3	990	4' 2"	1' 7"	1' 11"
F	...	25	...	...	15.6	3	3	990	"	"	"
F	...	...	32	...	15.0	3	3	990	"	"	"
G	25	...	...	...	18.7	4	4	1,360	4' 5"	1' 8"	2' 00"
G	...	35	...	...	21.8	4	4	1,360	"	"	"
G	...	...	45	...	21.5	4	4	1,360	"	"	"
G	...	...	...	70	21.0	4	12	1,360	"	"	"
K	75	...	...	...	52.5	12	12	3,090	5' 10"	2' 1"	2' 10"
K	...	100	...	...	56.5	12	12	3,090	"	"	"

 The **C** and **G** Dynamos of 800 c. p. give most perfect results—about 3½ lights to the h. p. —for **Manufacturing Establishments**, and for **Street Lighting** (placed 100 to 150 feet apart) will give unequalled illumination, and are not produced by any other system.

 The **K** Dynamos are unequalled by any system, either for **electrical out-put** or comparative weight of metal.

 Observe size of Belt as proof of economy of power.

LIST OF INCANDESCENT DYNAMOS

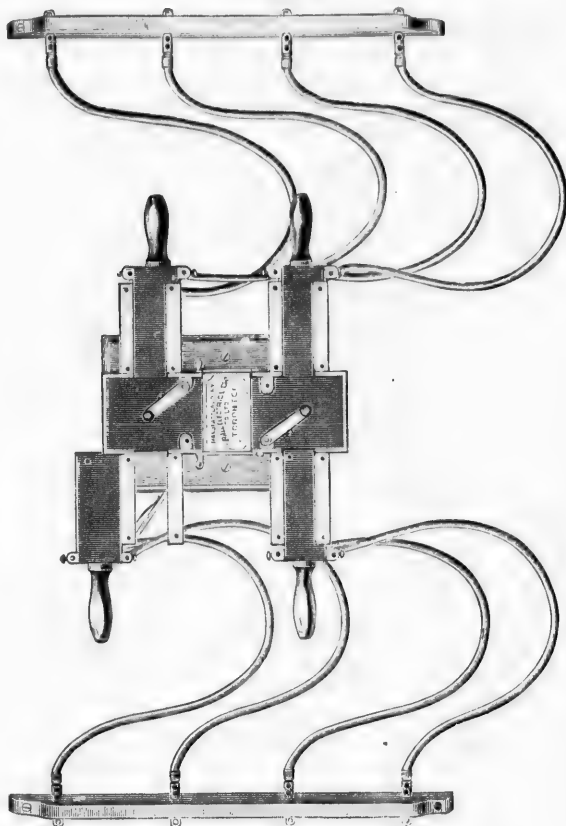
Number of Machine.	Volts.	Amperes.	No. Lights, 16 h. p.	Horse Power at Pulley of Dynamo.	Width of Single Belt in inches.	Belt Speed Required.	Weight of Dynamo.	SIZE IN INCHES.		
								Length.	Width.	Height.
C	53	81	66	6½	2	MIN.	530	3' 3"	1' 3"	1' 9"
C	100	43	66	6½	2		530	3' 3"	1' 3"	1' 9"
E	95	83	121	12½	3		780	3' 10"	1' 4"	1' 10"
E	74	102	116	12	3		780	3' 10"	1' 4"	1' 10"
F	100	107	164	15½	3		990	4' 2"	1' 7"	1' 11"
F	50	200	154	15½	3		990	4' 2"	1' 7"	1' 11"
G	75	100	230	23	5	5,000 FT. PER MIN.	1,360	4' 5"	1' 8"	2' 0"

SPECIAL DYNAMOS FOR POWER OR PLATING MADE TO SPECIFICATIONS

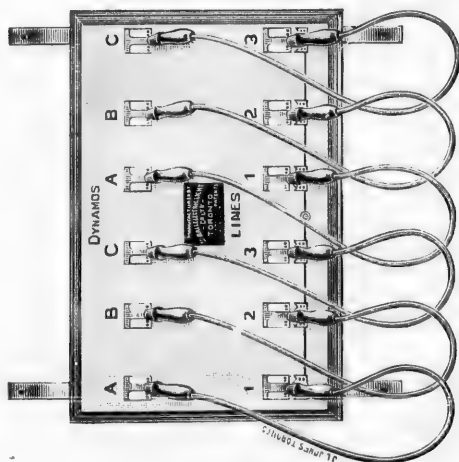
Lamps, holders, wiring, etc., on the most favorable terms.

SWITCH BOARDS FOR ANY NUMBER OF CIRCUITS OR DYNAMOS

No. 1



No. 2



INCHES.

Width.	Height.
2"	1' 5"
3"	1' 9"
4"	1' 10"
7"	1' 11"
8"	2' 00"
1'	2' 10"

p. give
he h. p.
nd for
art) will
nced by

by any
parative

omy of

OS

INCHES.

Width.	Height.
3"	1' 9"
3"	1' 9"
4"	1' 10"
4"	1' 10"
7"	1' 11"
7"	1' 11"
8"	2' 00"

IFICATIONS

e terms.

- - POINTS - -

- - OF - -

EXCELLENCE AND SUPERIORITY

THAT WE STAND READY TO MAINTAIN
AGAINST ALL COMPETITORS.

1. To produce a Steadier Light, no Hissing or Flickering.
2. To produce lights of equal Candle Power with Far Less Power  (less coal) than any other system.
3. Armatures will not "burn out" from any practical use, nor except through violence or the acts of malice.
4. Repairs average less than one per cent. per annum—far less than those of any other system.
5. Dynamo will give much greater efficiency than any other for given metal, power, and kind of work.
6. Our (double armature) Dynamo is virtually equivalent to two of other systems, for the reason that in case of accident to one armature the other will maintain nearly three-fourths of the full number of lights.
7. Will give incandescent lights from arc circuits in number and location required.
8. Length of circuits from Ball Dynamos unsurpassed by any system.
9. Patents have never been challenged, and are guaranteed unassailable.
10. Our Lamps require no cleaning of carbon rods and necessary renewal of same.
11. Our Improved Double Lamp excels in its action that of any other system.

**We CHALLENGE COMPETITION, in a public
or private test, if any one disputes
these claims.**

FACTS

OUR DYNAMOS are about one-third the weight of dynamos of other systems carrying the same number of lights.

OUR DYNAMOS require no foundation, but can be placed without bolting down on the floor of any building.

OUR DYNAMOS will outlast the dynamos of any other system.

Our DYNAMOS require the least amount of attention of any in the world.

OUR LAMPS are purely mechanical and do not depend upon springs and dash pots for their proper working.

OUR LAMPS do not burn out, neither do they require constant cleaning.

OUR LAMPS are not affected by thunder storms, nor extinguished by blasting or like causes.

No other system possesses these advantages.

Any mechanic can install and successfully operate the "Ball System" without the aid of an expert or electrician.

WE GUARANTEE

1.—Our 4-ampere or 800-c.p. Dynamos to give the most perfect results for MANUFACTURING ESTABLISHMENTS and for Street Lighting. Power required less than $\frac{1}{3}$ of a horse power per light.

2.—Our 6-ampere Dynamos do not require over $\frac{1}{2}$ H. P. per light.

3.—Our 8-ampere Dynamos do not require over $\frac{1}{3}$ H. P. per light.

4.—Our 10-ampere Dynamos do not require over $\frac{3}{4}$ H. P. per light.

5.—To renew any "Ball" Armature should it ever "burn out" from any inherent cause.

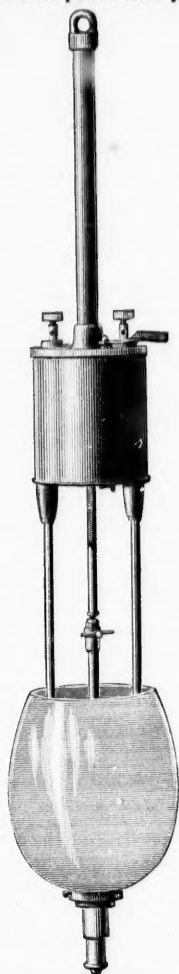
6.—To insure any Armature or Commutator that may fail from inherent defects, during three years, for the sum of \$25.

7.—To substitute successfully our Dynamos to maintain lamps of other systems now in use.

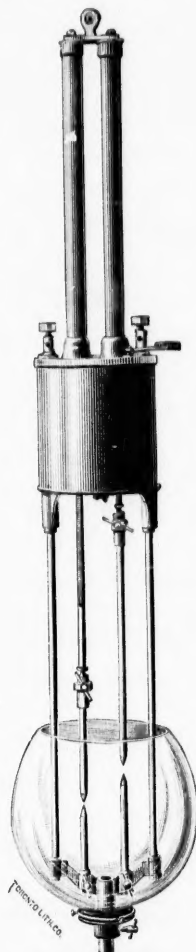
THE BALL SYSTEM

OF ELECTRIC LIGHTING

WE offer THE BALL System on its merits, and invite thorough investigation as to its superiority in all matters of detail. We claim for it Durability and Simplicity, and the Maximum of Economy in Cost, Operation and Maintenance, as compared with any other system. We claim much, but not more than we are prepared to prove and perform.



Single Lamp



Double Lamp

NOTE.—The falsehoods and misrepresentations of competitors have probably given this system more valuable and free advertising than it has received from any other source, except through the excellence of its operations.



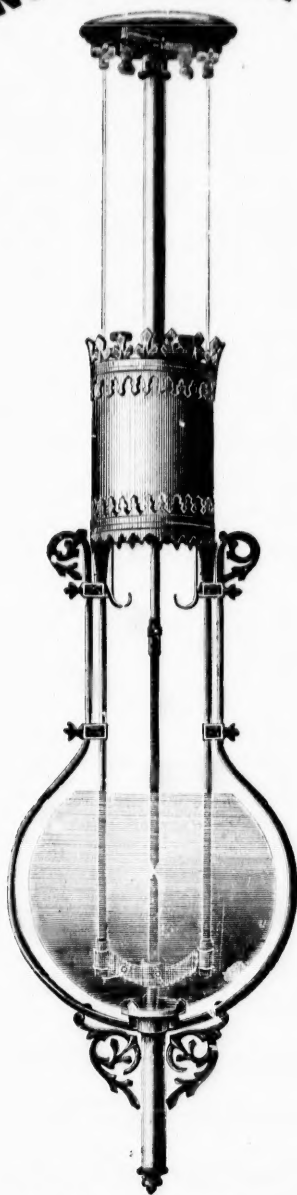
T

, and
iority
Dura-
ny in
n any
e are

tions
stem
has
h the



ARC OR INCANDESCENT LIGHTING



ORNAMENTAL BALL LAMP

